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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/317,056	05/24/1999	YASUTAKA NAKASHIBA	NEYM16.133	8595

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Katten Muchin Zavis Rosenman
575 Madison Avenue
New York, NY 10022-2585

EXAMINER	
AGGARWAL, YOGESH K	

ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 02/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/317,056	NAKASHIBA, YASUTAKA	
	Examiner	Art Unit	
	Yogesh K. Aggarwal	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5,6,9,10 and 13-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5,6,9,10 and 13-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Arguments

1. Applicant's arguments with respect to claims 1, 2, 5, 6, 9, 10 and 13-22 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 2, 9, 10, 13, 14, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over (USPN 4,875,101 to Endo et al.) in view of Kawahara et al. (US Patent # 4,696,021) and in further view of (Applicant's admitted prior art).

[Claim 1]

Endo discloses a method for driving a solid-state image pickup device which stores, in a plurality of photo-electric conversion units (e.g., Fig. 2), signal charges corresponding to an incident light during a prescribed time period, said photo-electric conversion units being provided with an overflow drain structure (e.g., element SD layer of Fig. 2 and figs. 4a-4i), excludes surplus charges from said photo-electric conversion units by an electric potential barrier (e.g., the electric potential barrier formed between SD layer and photodiode in Figs. 4B-4D; wherein the potential barrier excludes charges as shown in Figs. 4B as shown by arrow 120), said electric potential barrier being maintained at a first level between said OFD structure and said photo-electric conversion units during said prescribed time period (e.g., it is between photodiode and SD), reads out said signal charges by grouping said photo-electric conversion units into a prescribed number of regions (e.g., odd and even numbered fields), and outputs image signal from all of the photo-electric conversion units by repeating the read-out procedures, said read-out procedures

being carried out during a time period other than said prescribed time period, said read-out procedures comprising the steps of:

raising up said electric potential barrier to a higher level than the first level (e.g., Fig. 4G);

starting reading out said signal charges (e.g., Fig. 4G-4I).

Endo teaches an OFD structure and an electric potential barrier between said OFD and photoelectric conversion units but fails to teach each of said photo-electric conversion units being provided with an overflow drain structure. However Kawahara et al. teaches wherein each of said photo-electric conversion units being provided with an overflow drain (OFD) structure (e.g., elements 2 and 2' of Figs. 2B and 4A-4G).

Therefore taking the combined teachings of Endo and Kawahara, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have an overflow drain structure being provided for each of said photo-electric conversion units in order to have a construction that realizes high picture element density capable of high resolution and more particularly a high-efficiency solid-state area imaging device as taught in Kawahara (Abstract).

Endo in view of Kawahara does not disclose cutting off said incident light by a cut off means such as a mechanical shutter, however, AAPA discloses the use of a mechanical shutter to cut off incident light before reading out the signal charges (page 3, lines 13-16) for the very well known and established reason of eliminating the continual build up of excess charge by the photo-electric conversion units. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have used Applicants admitted use of a mechanical shutter

in Endo's invention in order to eliminate the continual build up of excess charge by the photo-electric conversion units.

In regards to claim 2 Examiner notes on that how much of an overflow barrier OFB potential barrier difference to secure is nothing more than a design matter that can suitably be determined by one skilled in the art according to the properties, etc. of the solid-stage pickup element that is used. Official Notice is taken. As such, it is only a matter of design choice to increase the potential barrier difference by a voltage greater than 0.4 V according to the properties, etc. of the solid-stage pickup element that is used.

In regards to claim 9 see examiners notes on the rejection of claim 1. Endo discloses a horizontal overflow drain as shown in fig. 2.

In regards to claim 10 see examiners notes on the rejection of claims 2 and 9.

In regards to claim 13 Endo discloses said signal charges are read out from said photo-electric conversion units though signal read-out portions (e.g., normal charge Q4 readout through sections VT of Figs. 2, 4G) and the electric potential of said electric potential barrier during the read-out step is deeper than an electric potential which is applied in signal read-out portion during the times except said read-out step (e.g., see Fig. 3C).

In regards to claim 14 see examiners notes on the rejection of claims 2 and 13.

In regards to claim 17 see examiners notes on the rejection of claim 13.

In regards to claim 18 see examiners notes on the rejection of claims 2 and 17.

In regards to claims 19-22 see Examiner's notes on the rejections above.

4. Claims 5, 6, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over (USPN 4,875,101 to Endo et al.) in view of Kawahara et al. (US Patent # 4,696,021), (Applicant's admitted prior art) and in further view of (USPN 5,903,021 to Lee et al).

In regards to claim 5 see examiners notes on the rejection of claims 1 and 9. Note that Endo does not teach to have a vertical OFD. Applicant's admitted prior art does teach to have a vertical OFD, however there is no explicit motivation in applicant's admitted prior art to use applicant's admitted vertical OFD in Endo's invention. Lee et al, herein Lee, teaches that either a lateral or vertical OFD can be used where in using a vertical overflow drain uses less photodetector area and thus increases the fill factor (column 6, lines 40-56 Lee). Therefore it would have been obvious to one of ordinary skill in the art to have used a vertical OFD in Endo's invention instead of a lateral OFD in order to increase the fill factor.

In regards to claim 6 see examiners notes on the rejection of claims 2 and 5.

In regards to claim 15 see examiners notes on the rejection of claim 13.

In regards to claim 16 see examiners notes on the rejection of claims 2 and 15.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yogesh K. Aggarwal whose telephone number is (571) 272-7360. The examiner can normally be reached on M-F 9:00AM-5:30PM.

5. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571)-272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

6. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YKA
January 29, 2006

DAVID OMETZ
SUPERVISORY PATENT EXAMINER